Warmup 10/
(*#of fractal art pictures on the wall*)

Suppose UPS charges a $3.50 flat fee to ship a package. They also charge 20 cents per ounce.

1. **Write an equation in slope-intercept form to represent the total cost of shipping x ounces.** **y = 0.20x + 3.50**
2. **How much would it cost to ship a 9-ounce package?** **$5.30**
3. **If you spent $8.10 to ship a package, how many ounces was it?** **23 oz.**

TEST FRIDAY

Converting between Tables/Equations/Graphs/Situations

Linear story problems

Slope & y-intercept

What do inputs & outputs represent

Should you connect the points?

Linear vs. Nonlinear

Proportional (today)

Shipping packages…

At a different company, a 3 ounce package cost $2.50 to ship and a 5 ounce package cost $2.70 to ship.

- **How much does it cost per ounce?** **$0.10**
- **Can you figure out what the flat fee was?** **$2.20**

Question 31

From Store A, the total cost to ship a 5-ounce package is $4.25, and the total cost to ship a 6-ounce package is $4.60. Store B charges a flat fee of $1.50, plus $0.50 per ounce to ship a package.

Which statement is true?

A) The flat fee for shipping is $0.15 more at Store B.
B) The flat fee for shipping is $1.00 more at Store A.
C) The flat fee for shipping is $1.15 more at Store B.
D) The flat fee for shipping is $2.00 more at Store A.

Question 34

Jana wrote the ordered pairs (2, 2), (4, 3), and (10, 6). These ordered pairs satisfy a linear function.

Which ordered pair satisfies the **same** linear function?

A) (12, 8)
B) (14, 7)
C) (20, 11)
D) (24, 16)

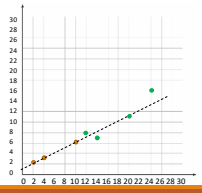
Think outside the box. There are <u>MANY</u> ways you can solve this problem!!!

Strategy 1: Use a graph (probably won't be precise enough unless you have graph paper!)

Jana wrote the ordered pairs (2, 2), (4, 3), and (10, 6). These ordered pairs satisfy a linear function.

Which ordered pair satisfies the **same** linear function?

A) (12, 8)
B) (14, 7)
C) (20, 11)
D) (24, 16)



Strategy 2: Use a table

___ Jana wrote the ordered pairs (2, 2), (4, 3), and (10, 6). These ordered pairs satisfy a linear function. _____

Which ordered pair satisfies the **same** linear function?

A) (12, 8)
B) (14, 7)
C) (20, 11)
D) (24, 16)

x	y
2	2
4	3
6	4
8	5
10	6
12	7
14	8
16	9
18	10
20	11

Linear = Constant Rate of Change for X AND Y

Strategy 3: Figure out the EQUATION

___ Jana wrote the ordered pairs (2, 2), (4, 3), and (10, 6). These ordered pairs satisfy a linear function. _____

Which ordered pair satisfies the **same** linear function?

A) (12, 8)
B) (14, 7)
C) (20, 11)
D) (24, 16)

	0	1
	x	y
	2	2
	4	3
	6	4
	8	5
	10	6

Slope = $\frac{change\ in\ y}{change\ in\ x}$
$= \frac{1}{2}$

EQUATION:
$y = \frac{1}{2}x + 1$

Now test the rule out for each choice! It only works for C. $\frac{1}{2}(20) + 1 = 11$.

Strategy 4: Use the slope formula

___ Jana wrote the ordered pairs (2, 2), (4, 3), and (10, 6). These ordered pairs satisfy a linear function. _____

Which ordered pair satisfies the **same** linear function?

A) (12, 8)
B) (14, 7)
C) (20, 11)
D) (24, 16)

Slope = $\frac{y_2 - y_1}{x_2 - x_1}$
$= \frac{3-2}{4-2}$
$\boxed{= \frac{1}{2}}$

Then test each choice. It doesn't matter which original point you pick!

A: $\frac{8-2}{12-2} = \frac{6}{10}$ ✗

C: $\frac{11-2}{20-2} = \frac{9}{18} = \frac{1}{2}$ ✓

Mini-Lesson:

PROPORTIONAL RELATIONSHIPS

0	5
1	8
2	11
3	14
4	17

x	y	
5	20	times 4
6	23	NOT times 4
7	26	NOT times 4
8	29	etc.
9	32	

Milton was supposed to find the equation from the table. He reasoned that since $5 \cdot 4 = 20$, the equation is y = 4x. Is Milton correct? If so, explain why. If not, explain what he did wrong, and provide the correct equation.

The slope is 3, not 4.

y = 3x + ___

y = 3x + 5

0	0
2	6
4	12

x	y	
6	18	times 3
8	24	times 3
10	30	times 3
12	36	etc.
14	42	

$\frac{\Delta y}{\Delta x} = \frac{6}{2} = 3$

Marvin divided 18 by 6 and got 3. He reasoned that the equation is y = 3x. Is Marvin correct? If so, explain why. If not, explain what he did wrong, and provide the correct equation.

It works for each row!

This a "special" linear relationship that is 1 step, not 2.

y = 3x + 0

y = 3x

- A linear relationship that has no y-intercept is called a <u>proportional</u> relationship.
- This is because the x and y-values will always have the same ratio.

Proportional Relationships

"Harriet sells bracelets for $5 each."

y = 5x

x	y
0	0
1	5
2	10
3	15
4	20

"Harriet already has $20, and she sells bracelets for $5 each."

y = 5x + 20

x	y
0	20
1	25
2	30
3	35
4	40

Is it proportional?

# of CDs bought (x)	Price (y)
1	$15
2	$30
3	$45
4	$60
5	$75

YES

Equation: y = 15x

Is it proportional?

# of shirts bought	Price
1	$20
2	$32
3	$44
4	$56
5	$68

NO

Equation: y = 12x + 8

Is it proportional?

Minutes (x)	Situps (y)
3	60
5	100
7	140
9	180
11	220

YES

Equation: y = 20x

Is it proportional?

Years (x)	Height of Person (y)
2	30
3	33
4	36
5	39
6	42

NO

Equation: y = 24 + 3x

Is it proportional?

Minutes since Joe started reading today (x)	Page of book Joe is on (y)
10	50
20	60
30	70
40	80
50	90

NO

Equation: y = 40 + 1x

Is it proportional?

Minutes spent writing a paper(x)	Pages written(y)
20	4
40	8
60	12
80	16
100	20

YES

Equation: $y = \frac{1}{5}x$

Homework: Linear Story Problems Worksheet